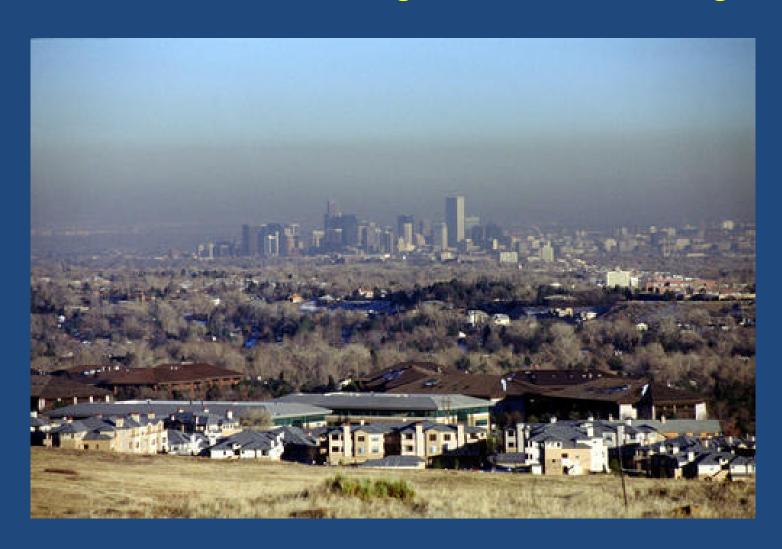
Public Comments on the PM NAAQS: Particulate Matter Urban-Focused Visibility Assessment Second External Review Draft

Comments to CASAC March 11, 2010

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Urban VAQ: What Meets the Eye is More Complex than Extinction Measured at a Single Site and Wavelength





Faults in UFVA Measure of UAQ

- UVAQ is due to many factors beside 550 nm extinction
 - Urban VAQ requires consideration of wavelengthdependent extinction which leads to discoloration
 - Uniform extinction reduces visual range (e.g., Class I areas)
 - Wavelength-dependent extinction associated with NO₂ and ultra-fine carbonaceous particulate cause discoloration
 - Hourly point extinction measurements are too variable to properly characterize UVAQ
 - Integration over the line of sights in different directions require either path-integrated or multiple point measurements
 - Four-hour averages would better reflect the time scales in which how meteorology and PM components interact to affect UVAQ



Urban VAQ Preference Studies Are Not Definitive

UFVA previously acknowledged incomplete and flawed studies:

"Additional studies, including directly comparable studies using similar methods in diverse cities, are necessary to gain further understanding of preferences for urban visibility" (page 2-26 of External Review Draft)

- Wide range of "acceptable" extinction identified
 - Study methods vary among and within a given urban region
 - strong evidence that study design influences results
 - strong and profound inter-regional differences in VAQ perception
 - view of computer-generated photographs of simulated extinction levels does not adequately simulate visual experience as it relates to welfare
- Because studies are flawed and inconclusive, additional studies needed before an NAAQS for VAQ can be established



24-hour PM_{2.5} Mass Not a Surrogate for UVAQ

- PM_{2.5} mass consists of consists of a large number of species with a range of optical properties
- Contributions vary daily with weather patterns, upwind source regions and season
- The way extinction increases with humidity vary widely among species
- Measurements need to be averaged over a number of sites in an urban area rather than a single site which is affected by local sources of primary PM_{2.5}
- Natural interferences (sea salt, wildfires, snow, rain, fog, etc.) need to be addressed



Overall Summary of Comments

- There is no definitive "acceptable" extinction level upon which to base a VAQ NAAQS for all urban areas
- Extinction at only one visible wavelength and based only on PM_{2.5} mass cannot be used as a definitive indicator of VAQ
- Particle mass extinction relationship is highly complex
 - also depends on particle number, size, species, humidity
 - all of these highly variable over space and time
- Difficulty to regulate visibility with a single ambient standard is illustrated by the Regional Haze Program, which takes a more flexible, site-specific approach
- Due to these issues, it is inappropriate to establish a massbased secondary PM_{2.5} NAAQS to address urban VAQ

